CITY OF TROY (GROUND WATER) (PWS 2290041)
SOURCE WATER ASSESSMENT FINAL REPORT

December 6, 2002

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated source water assessment area and sensitivity factors associated with the well and aquifer characteristics.

This report, *Source Water Assessment for City of Troy, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The City of Troy drinking water system consists of two active groundwater wells and one surface water treatment facility. The system currently serves approximately 1000 people through 420 connections. This report will concentrate on the ground water sources (wells). A report of the surface water source, "City of Troy (Surface Water) PWS# 2290041" can be acquired by contacting the Lewiston Regional Office of the DEQ at 1-887-541-3304.

Final susceptibility scores are derived from equally weighing system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other categories results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential Contaminants/Land Uses are divided into four categories, inorganic contaminants (IOCs, i.e. nitrates, arsenic), volatile organic contaminants (VOCs, i.e. petroleum products), synthetic organic contaminants (SOCs, i.e. pesticides), and microbial contaminants (i.e. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

In terms of total susceptibility, Big Meadow Well rated moderate for IOCs, VOCs, SOCs, and microbials. System construction and hydrologic sensitivity rated moderate, and land use rated high for IOCs, moderate for VOCs and SOCs, and low for microbials.

In terms of total susceptibility, Duthie Park Well rated moderate for IOCs, VOCs, SOCs, and microbials. System construction rated moderate, hydrologic sensitivity rated low, and land use rated low for IOCs, VOCs, SOCs, and microbials.

No VOCs or SOCs have ever been detected in either well. Trace concentrations of the IOCs barium, calcium, chlorine chromium, fluoride, iron, magnesium, manganese, nitrate, potassium, silica, sodium, sulfate, and zinc have been detected in tested water, but at concentrations significantly below maximum contamination levels (MCLs) as set by the Environmental Protection Agency (EPA). As the City of Troy water system exists within a county of medium nitrogen fertilizer use, high herbicide use, and high agricultural chemical use, nitrate contamination may become a water quality issue. At the present time however, nitrate has only been detected in the well in concentrations of less than 2.0 parts per million (ppm), significantly below the MCL of 10 ppm. Total coliform has had a repeat detection once in September 2002.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the City of Troy, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). Actions should be taken to keep a 50-foot radius circle clear of all potential contaminants from around the wellhead. Any contaminant spills within the delineation should be carefully monitored and dealt with. As much of the designated protection areas are outside the direct jurisdiction of the City of Troy, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of drinking water protection. In addition, the well should maintain sanitary standards regarding wellhead protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus on any drinking water protection plan as the delineation contains some urban and residential land uses. Public education topics could include proper lawn care practices, household hazardous waste disposal methods, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. As there are transportation corridors through the delineation, the Idaho Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the Latah Soil and Water Conservation District, and the Natural Resource Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific bet management practices). For assistance in developing protection strategies please contact the Lewiston Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR CITY OF TROY, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the rankings of this assessment mean.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment is also included.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the EPA to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The local community, based on its own needs and limitations, should determine the decision as to the amount and types of information necessary to develop a drinking water protection program. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The City of Troy drinking water system consists of two active groundwater wells and one surface water treatment facility. The system currently serves approximately 1000 people through 420 connections. This report will concentrate on the ground water sources (wells). A report of the surface water source, "City of Troy (Surface Water) PWS# 2290041" can be acquired by contacting the Lewiston Regional Office of the DEQ at 1-887-541-3304.

No VOCs or SOCs have ever been detected in either well. Trace concentrations of the IOCs barium, calcium, chlorine chromium, fluoride, iron, magnesium, manganese, nitrate, potassium, silica, sodium, sulfate, and zinc have been detected in tested water, but at concentrations significantly below MCLs as set by the EPA. As the City of Troy water system exists within a county of medium nitrogen fertilizer use, high herbicide use, and high agricultural chemical use, nitrate contamination may become a water quality issue. At the present time however, nitrate has only been detected in the well in concentrations of less than 2.0 ppm, significantly below the MCL of 10 ppm. Total coliform has had a confirmed detection once, in September, 2002.

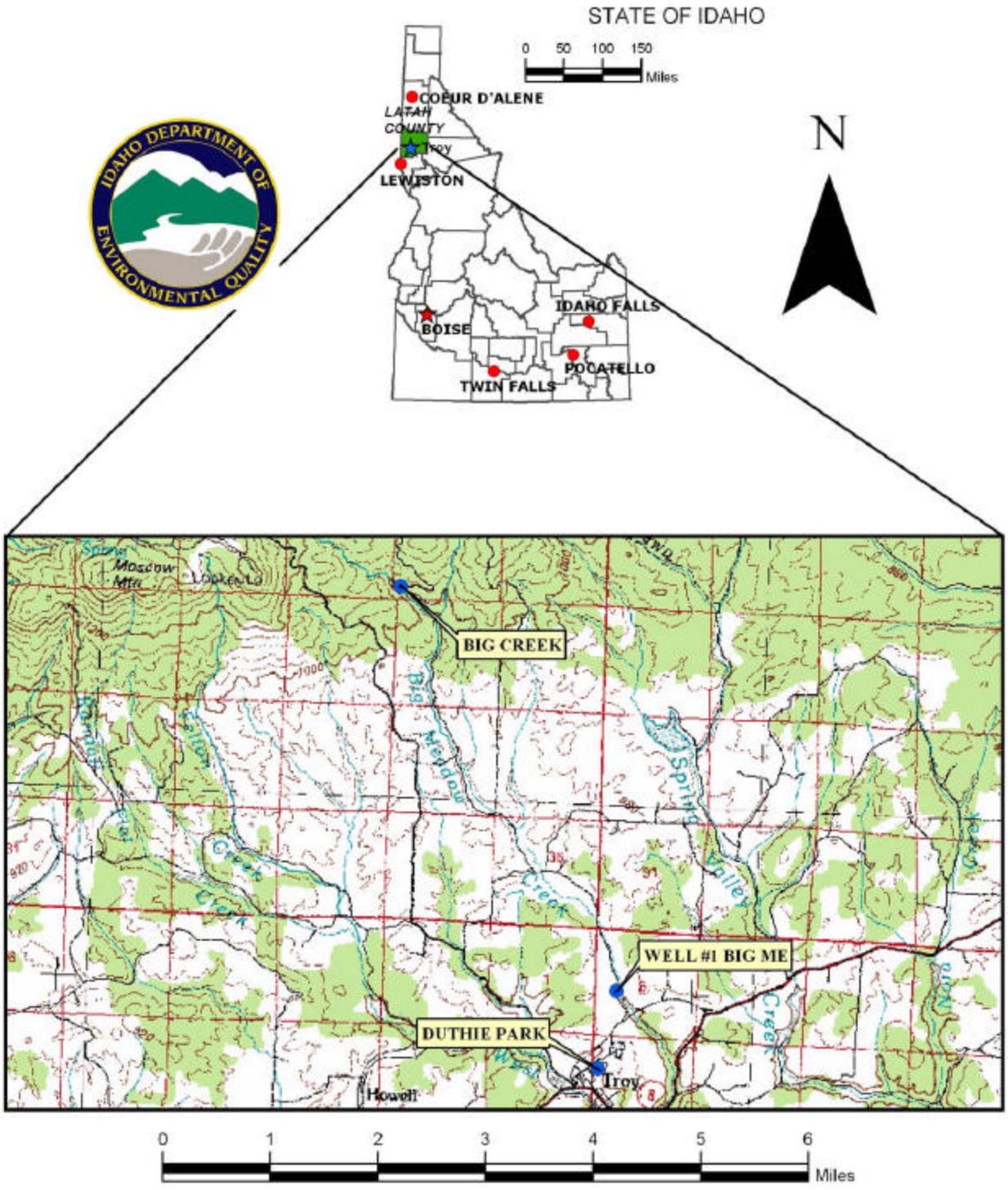
Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ contracted with the University of Idaho to perform the delineations using a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water in the vicinity of the City of Troy wells. The computer model used site specific data, assimilated by the University of Idaho from a variety of sources including operator input, local area well logs, and hydrogeologic reports (detailed below).

The conceptual hydrogeologic model for Troy is based on interpretations presented in Ralston and Bush (1995), available well logs, and published geologic maps of the Troy area. Bedrock geology is based on the geologic maps of the Pullman quadrangle at a scale of 1:250,000 (Rember and Bennett, 1979) and the Potlatch 30 X 60 Quadrangle, Idaho (Lewis et al., 2001). According to published geologic maps, the City of Troy is located near the northern margin of the Clearwater Embayment – the easternmost extent of the Columbia River Basalt Group (CRBG). Recent geologic mapping provides evidence that Troy is actually underlain by the Onaway basalt, which is 26 million years old, approximately 10 million years older than the oldest CRBG rocks (J. Bush, personal communication). Well logs are not available for either of the source wells. The area is underlain by pre-Tertiary crystalline basement rocks. Surficial sediments of the Palouse Loess and more recent alluvium cover the basalt in most of the area. The City of Troy is currently served by two ground water wells (Big Meadow Well 1 and Duthie City Park Well).

The basalt forms the major aquifers in the area with well yields above 100 gallons per minute (gpm). Pre-Tertiary basement rock is encountered at shallow depths (less than 300 feet) at some locations west and south of town. The basement rock has a low hydraulic conductivity and usually produce less than 5 gpm. The shallow depth to basement rock limits the thickness of the CRBG in many locations in Troy.

FIGURE 1- GEOGRAPHIC LOCATION OF CITY OF TROY
DUTHIE PARK, WELL #1 BIG ME, BIG CREEK, PWS 2290041



Ralston and Bush (1995) conclude that both source wells draw their water from the Grande Ronde formation of the CRBG. Big Meadow Well 1, at a higher elevation than the Duthie Park well, penetrates the cap of the Wanapum formation, but water comes from a zone in the Grande Ronde (Ralston and Bush, 1995).

Based on different static water level elevations (2600 ft mean sea level (msl) in Big Meadow and 2500 ft msl in Duthie Parrk) the two source wells may draw their water from different zones within the Grande Ronde formation (Ralston and Bush, 1995); however, the Grande Ronde is treated as a single aquifer.

Neighboring private wells were used for test points. Information on test points was obtained from Ralston and Bush (1995) and a search of the Idaho Department of Water Resources database available on the Internet. The locations of the test points are limited to information supplied on well logs, typically in the quarter-quarter section (0.625 square mile). Therefore, the accuracy of the test point elevation and the static water elevation is dependent upon the accuracy of the driller's log; the accuracy decreases as relief increases in the quarter-quarter section.

The WhAEM model is used to delineate the capture zones.

The delineated source water assessment areas for the well of City of Troy wells can best be described as northwest trending corridors approximately 1.5 miles long and 0.5 miles wide (Figure 2 and Figure 3). The actual data used by the University of Idaho in determining the source water assessment delineation area is available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of groundwater contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

Land-use within the immediate area and the surrounding area of the City of Troy wells contain urban activity (Duthie Park Well), however, the predominant land use is dryland agriculture and rangeland.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in May and June 2002. The first phase involved identifying and documenting potential contaminant sources within the City of Troy source water assessment area (Figure 2 and Figure 3) through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the area.

The delineated source water assessment areas of the City of Troy wells contains a general contractor and an excavation contractor. In addition, Big Meadow Road and Big Meadow Creek (Table 1, Figure 2) and McKeehan Road (Table 2, Figure 3) could contribute leachable contaminants to the aquifer in the event of an accidental spill, release, or flood.

Table 1. City of Troy, Well #1 Big Meadow, Potential Contaminant Inventory and Land Use

Site	Description of Source	TOT[1] Zone	Source of Information	Potential Contaminants[2]
1	Excavating Contractor	0-3 YR	Database Search	IOC, VOC, SOC
	Big Meadow Road	0-10 YR	GIS Map	IOC, VOC, SOC, Microbials
	Big Meadow Creek	0-10 YR	GIS Map	IOC, VOC, SOC, Microbials

[1] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

[2] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

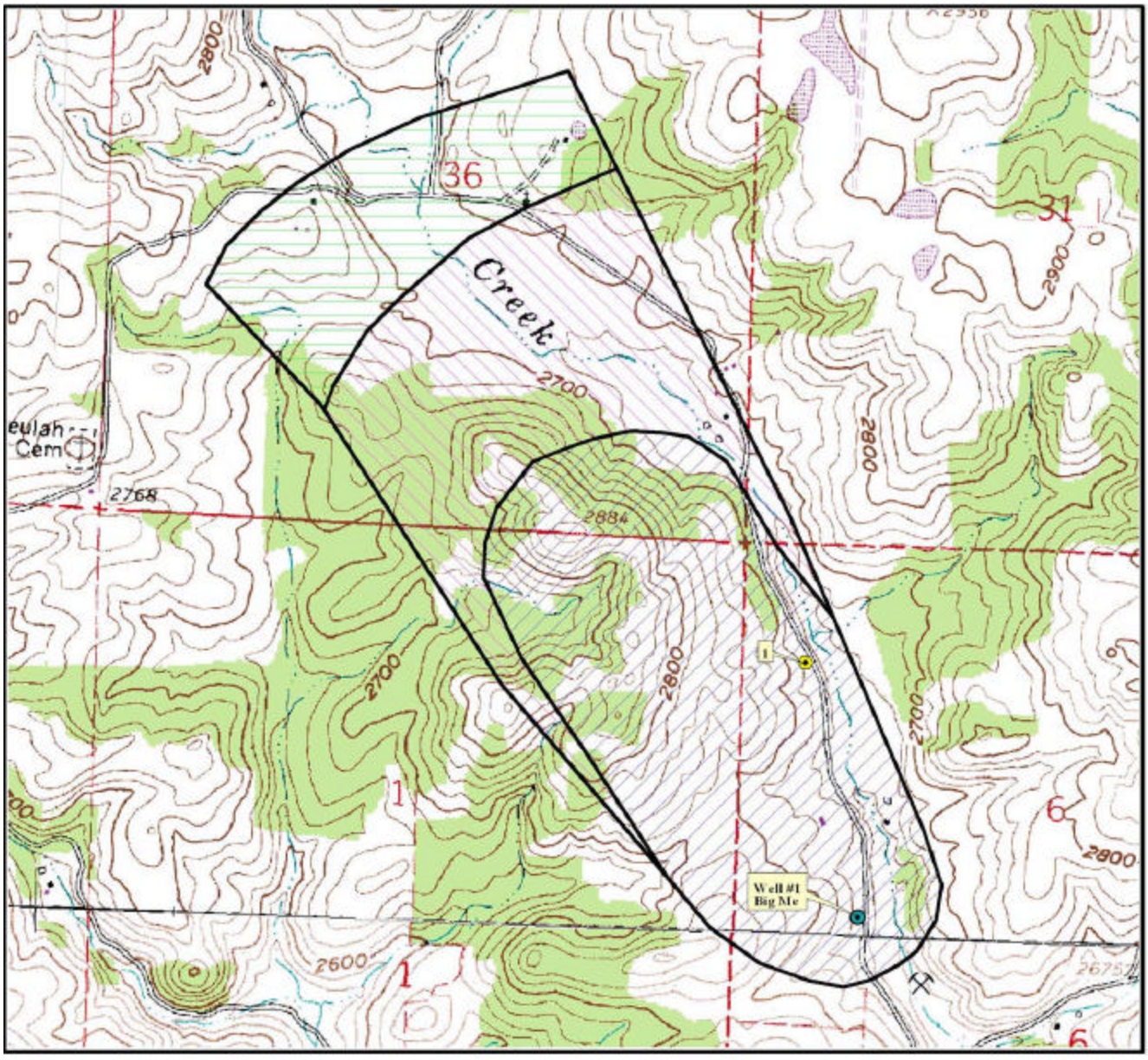
Table 2. City of Troy, Duthie Park, Potential Contaminant Inventory and Land Use

Site	Description of Source	TOT[1] Zone	Source of Information	Potential Contaminants[2]
1	General Contractor	0-3 YR	Database Search	IOC, VOC, SOC
	McKeehan Road	0-3 YR	GIS Map	IOC, VOC, SOC, Microbials

[1] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

[2] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

FIGURE 2 - City of Troy Delineation Map and Potential Contaminant Source Locations



LEGEND

PCI IDTM
- 1B (3 yr TOT)
- 2 (6 yr TOT)
- 3 (10 yr TOT)
- Wellhead
- Enhanced Inventory
- CERCLIS Site
- RCRIS Site
- Dairy
- LUST Site
- Closed UST Site
- Open UST Site
- Business Mailing List
- NPDES Site
- Mine
- AST
- Toxic Release Inventory
- SARA Title III Site (EPCRA)
- Recharge Point
- Injection Well
- Group1 Site
- Cyanide Site
- Landfill
- Wastewater Land App.Site

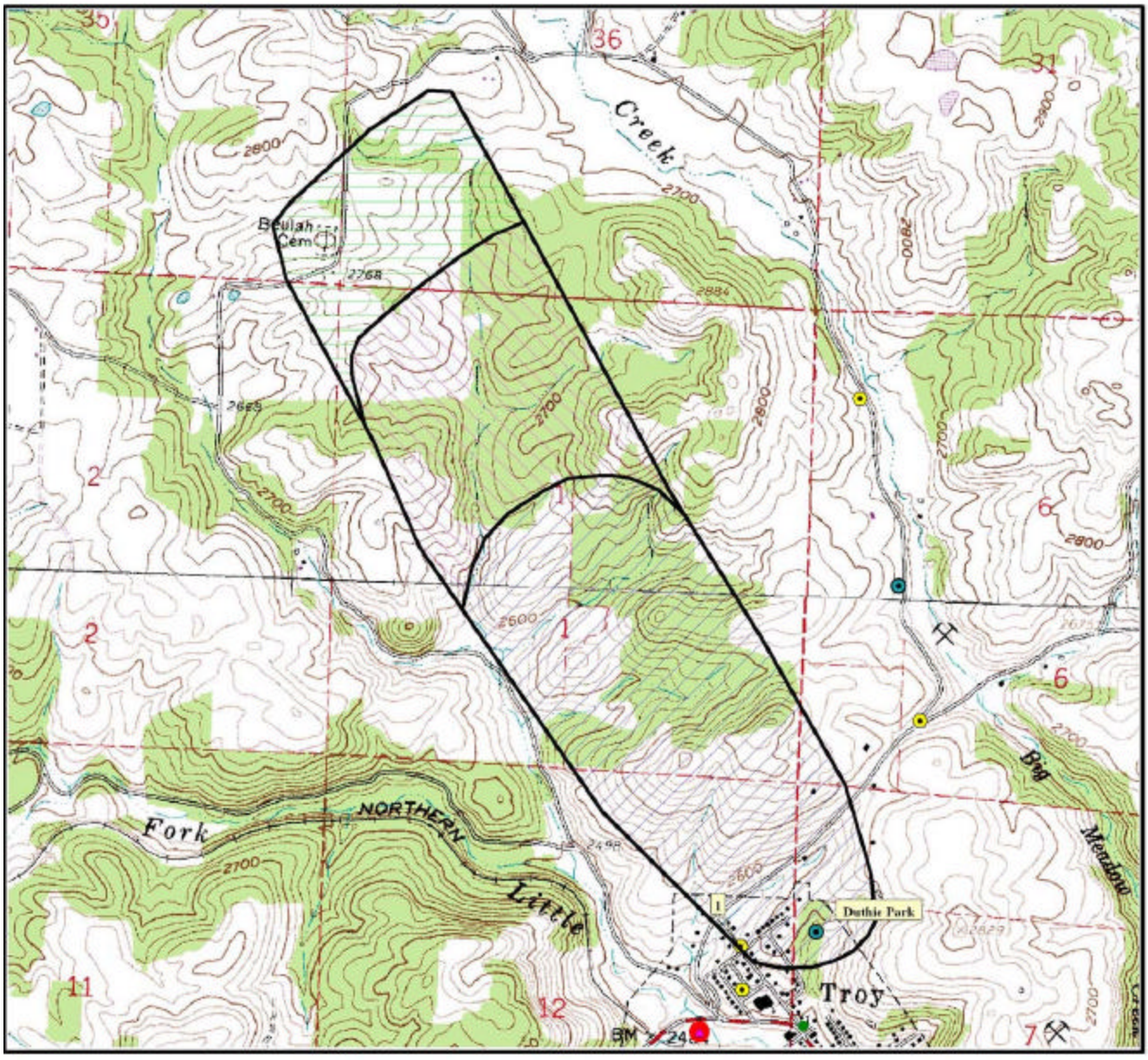
N

IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

Technical Services
Data/GIS
W. Kelley 8/22/02

PWS# 2290041
Well #1 Big Me

FIGURE 3 - City of Troy Delineation Map and Potential Contaminant Source Locations



Section 3. Susceptibility Analyses

A well's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheets for the system. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone (aquitard) above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity rated moderate for Big Meadow Well. Area soils are poorly to moderately drained, positively affecting the score. However, due to a well log with minimal information and vague information on the 1990 Sanitary Survey, the vadose zone composition and presence of an aquitard are unknown. The water table depth is unknown, however, as the well is only 250 feet deep, it is less than 300 feet.

Hydrologic sensitivity rated low for the Duthie Park Well. Positively affecting the rating is the fact that area soils are poorly to moderately drained, the vadose zone is composed predominantly of clay or clayey units, and an aquitard is present. The well log indicated a water table of only 60 feet.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced. A sanitary survey was conducted in 1995 for the system.

Big Meadow Well rated moderate for system construction. Information from the 1995 Sanitary Survey and a vague well record noted the following: The well is 250 feet deep and is 10 inches in diameter. The casing is perforated between 40 feet below ground surface (bgs) to 250 feet bgs. An annular seal was placed to 30 feet. The surface seal and wellhead are noted to be adequate and in good condition. As perforations start at only 40 feet bgs, the well's highest production comes from less than 100 feet below the water table. Finally, due to the vagueness of the well record, it is unknown if the casing and annular seal extend into low permeability units, or if the casing thickness meets current regulations.

The Duthie Park Well also rated moderate for system construction. The well log indicated that it was drilled in 1993 and is 515 feet deep. A 10-inch casing 0.250 inches thick extends 515 bgs into a fractured basalt unit, and perforations were cut via torch between 495 bgs and 515 bgs within that fractured basalt unit. A bentonite clay annular seal was placed 75 feet bgs into a unit of "basalt with clay seams". The well is located outside of the 100-year floodplain and its highest production comes from more than 100 feet below the water table. The rating was increased because the casing was not seated into an impermeable unit, and it is unknown if the wellhead and surface seal are maintained.

In addition, the well casing thickness does not meet current regulations.

Though the well may have been in compliance with standards when they were completed, current PWS well construction standards are more stringent. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. These standards include provisions for well screens, pumping tests, and casing thicknesses to name a few. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. A ten-inch casing requires a thickness of 0.365 inches. As such, the well was assessed an additional point in the system construction rating.

Potential Contaminant Source and Land Use

Well #1 rated high for IOCs (i.e. nitrates, arsenic), moderate for VOCs (i.e. petroleum products, chlorinated solvents) and SOCs (i.e. pesticides), and low for microbial contaminants (i.e. bacteria). The Duthie Park Well rated low for each of the four potential contaminant categories. The minimal number and location of potential contaminant sources within each delineation, the amount of agricultural land within each delineation, and the high county-wide herbicide and agricultural chemical use contributed to the land use scores.

Final Susceptibility Ranking

An IOC detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Additionally, if there are contaminant sources located within 50 feet of the source then the wellhead will automatically get a high susceptibility rating. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) and agricultural land contribute greatly to the overall ranking.

Table 3. Summary of City of Troy Susceptibility Evaluation

Well	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Big Meadow Well	M	H	M	M	L	M	M	M	M	M
Duthie Park Well	L	L	L	L	L	M	M	M	M	M

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

The City of Troy drinking water system consists of two active groundwater wells and one surface water treatment facility. The system currently serves approximately 1000 people through 420 connections. This report will concentrate on the ground water sources (wells). A report of the surface water source, "City of Troy (Surface Water) PWS# 2290041" can be acquired by contacting the Lewiston Regional Office of the DEQ at 1-887-541-3304.

In terms of total susceptibility, Big Meadow Well rated moderate for IOCs, VOCs, SOCs, and microbials. System construction and hydrologic sensitivity rated moderate, and land use rated high for IOCs, moderate for VOCs and SOCs, and low for microbials.

In terms of total susceptibility, Duthie Park Well rated moderate for IOCs, VOCs, SOCs, and microbials. System construction rated moderate, hydrologic sensitivity rated low, and land use rated low for IOCs, VOCs, SOCs, and microbials.

Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the City of Troy, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey. No chemicals should be stored or applied within the 50-foot radius of the wellhead. As much of the designated protection areas are outside the direct jurisdiction of the City of Troy, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of drinking water protection. In addition, the well should maintain sanitary standards regarding wellhead protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. As there are many houses within the delineation, a strong public education program should be a primary focus of any drinking water protection plan. Public education topics could include proper lawn and garden care practices, hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Lewiston Regional Office of the DEQ or the Idaho Rural Water Association.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Lewiston Regional DEQ Office (208) 799-4370

State DEQ Office (208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper, mlharper@idahoruralwater.com, Idaho Rural Water Association, at 208-343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5 mg/L.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

Bush, J.; 2001. Personal Communication

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

Idaho Department of Agriculture, 1998. Unpublished Data.

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Administration, 1971. Well log for Village of Onaway

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Idaho Division of Environmental Quality, 1990. Sanitary survey for City of Troy

Idaho Division of Environmental Quality, 1995. Ground Water Under Direct Influence Field Survey, PWS 2290041.

Lewis, R.A., and Cherry, J.A.; 1979. Groundwater, Prentice Hall, Englewood Cliffs, NJ, 604p

Lewis, R.S., Bush, J.H., Burmester, R.F., Kauffman, J.D., Garwood, D.L., Meyers, P.E., Othberg, K.L., and McClelland, W.; 2001. Geologic Map of the Potlatch 30 X 60 Quadrangle, Idaho, Idaho Bureau of Mines and Geology, Moscow, ID.

Ralston, D.R., and Bush, J.H.; 1995. Hydrogeology of the Troy Area and Analysis of Well Development Potential. Dale R. Ralston, Consultant in Hydrogeology, Report.

Rember, W.C., and Bennett, E.H.; 1979. Geologic Map of the Pullman Quadrangle, Idaho, Idaho Bureau of Mines and Geology, Moscow, ID.

Attachment A

City of Troy
Susceptibility Analysis
Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report Public Water System Name : TROY CITY OF Well# : WELL #1 BIG ME
Public Water System Number 2290041 11/01/2002 12:42:32 PM

1. System Construction		SCORE
Drill Date	08/27/1973	
Driller Log Available	NO	
Sanitary Survey (if yes, indicate date of last survey)	YES	1990
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	YES	0
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		4

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		4

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	0	2	0
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	3	3	3	2
(Score = # Sources X 2) 8 Points Maximum		6	6	6	4
Sources of Class II or III leacheable contaminants or	YES	6	2	2	
4 Points Maximum		4	2	2	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		14	12	12	8
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	25 to 50% Irrigated Agricultural Land	1	1	1	
Potential Contaminant Source / Land Use Score - Zone II		4	4	4	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0
Cumulative Potential Contaminant / Land Use Score		22	18	20	8
4. Final Susceptibility Source Score		12	12	12	11
5. Final Well Ranking		Moderate	Moderate	Moderate	Moderate

Ground Water Susceptibility Report Public Water System Name : TROY CITY OF Well# : DUTHIE PARK
Public Water System Number 2290041 11/01/2002 11:12:31 AM

1. System Construction		SCORE				
Drill Date	01/27/1993					
Driller Log Available	YES					
Sanitary Survey (if yes, indicate date of last survey)	YES	1990				
Well meets IDWR construction standards	NO	1				
Wellhead and surface seal maintained	NO	1				
Casing and annular seal extend to low permeability unit	NO	2				
Highest production 100 feet below static water level	YES	0				
Well located outside the 100 year flood plain	YES	0				
Total System Construction Score		4				
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained	YES	0				
Vadose zone composed of gravel, fractured rock or unknown	NO	0				
Depth to first water > 300 feet	NO	1				
Aquitard present with > 50 feet cumulative thickness	YES	0				
Total Hydrologic Score		1				
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score	
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0	
Farm chemical use high	YES	2	0	2		
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO	
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	0	2	0	
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)	YES	2	2	2	1	
(Score = # Sources X 2) 8 Points Maximum		4	4	4	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1		
4 Points Maximum		1	1	1		
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0	
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone 1B		5	5	5	2	
Potential Contaminant / Land Use - ZONE II						
Contaminant Sources Present	NO	0	0	0		
Sources of Class II or III leacheable contaminants or	YES	1	0	0		
Land Use Zone II	25 to 50% Irrigated Agricultural Land	1	1	1		
Potential Contaminant Source / Land Use Score - Zone II		2	1	1	0	
Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present	NO	0	0	0		
Sources of Class II or III leacheable contaminants or	NO	0	0	0		
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0		
Total Potential Contaminant Source / Land Use Score - Zone III		0	0	0	0	
Cumulative Potential Contaminant / Land Use Score		9	6	8	2	
4. Final Susceptibility Source Score		7	6	7	6	
5. Final Well Ranking		Moderate	Moderate	Moderate	Moderate	